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Patent Claims

1. A method for processing a moving workpiece (1), in particular a vehicle body (1) which is moved by means of a conveyor belt (10),

- which method uses, for processing the workpiece (1), a processing system (4) with a processing tool (5) which is attached to the hand (12) of a robot (7) and which comprises a sensor system (18) which is permanently connected to the processing tool (5) and has at least one sensor (19), having the following method steps:
- the robot's hand (12) with the processing tool (5) is moved, within the scope of a positioning phase (A-2), into a working position (23) in which the processing tool (5) is oriented in a precisely positioned fashion with respect to a reference area (9) of the workpiece (1) which is moved on the conveyor belt (10),
- and the processing tool (5) then passes through a processing phase (B) during which the processing tool (5) remains oriented with respect to the reference area (9) on the workpiece (1),

wherein, during the positioning phase (A-2) and the processing phase (B), an iterative closed-loop control process is run through, in the course of which

- an (actual) measured value of the reference area (9) of the workpiece (1) is generated by the at least one sensor (19),
- this (actual) measured value is compared with a (setpoint) measured value generated within the scope of a set up phase (II),
- a movement vector of the robot's hand (12) is calculated from the difference between the (actual) measured value and (setpoint) measured value using a Jacobi matrix calculated within the scope of the set-up phase,
- the processing tool (5) is moved by this movement vector.

2. The method as claimed in one of the preceding claims, characterized in that a TCP/IP interface is used for the purpose of communication between a control system (20) of the robot (7) and the evaluation unit (26) of the sensor system (18).

3. The method as claimed in one of the preceding claims, characterized in that in order to position the processing tool (5) with respect to different vehicle body types or with respect to different reference areas (9) of the same vehicle body type, the measured values of different individual sensors (14, 14") of the sensor system (13) are used for closed-loop position control.

4. The use of the method as claimed in one of claims 1 to 4, characterized in that the method is used for mounting a roof module (3) in a roof opening (2) in a vehicle body (1).

5. The use of the method as claimed in one of claims 1 to 4, characterized in that the method is used for mounting a windshield (3`) in a front window opening (2`) in a vehicle body (1).

6. A processing system (4) for processing a moving workpiece (1), in particular a vehicle body (1) which is moved by means of a conveyor belt (10),

- having a processing tool (5) which is attached to a hand (12) of a robot (7), and
- having a control system (20) for controlling the robot (7) and the processing tool (5), characterized
- in that the processing system (4) comprises a sensor system (18) having at least one sensor (19) which is permanently connected to the processing tool (5),
- in that the processing system (4) also comprises an evaluation unit (26) for evaluating the measured values of the sensor system (18),
- in that, during a positioning and processing phase (A-2, B) of the processing system (5), the at least one sensor (19) is directed toward a reference area (9) of the moving workpiece (1),
- and in that, using the measured values of the sensor system (18), the processing tool (5) can be coupled in a contact-free fashion to the path movement of the moving workpiece (1).

7. The processing system as claimed in claim 7, characterized in that the at least one sensor (19) is a noncalibrated sensor.

8. The processing system as claimed in claim 7 or 8, characterized in that the at least one sensor (19) is an optical sensor which measures over an area.